AUTHOR'S CORRECTION

Mechanism of Bactericidal Action of Aminoglycosides

BERNARD D. DAVIS

Bacterial Physiology Unit, Harvard Medical School, Boston, MA 02115

Volume 51, no. 3, p. 341–350: This article focused on the role of nonspecific membrane damage in the uptake of aminoglycosides and on the role of misread proteins in creating that damage. It was assumed that after entry of the antibiotic its blockade of initiating ribosomes accounts for its lethal effect. Evidence for an additional lethal mechanism had inadvertently been overlooked (N. Tanaka, K. Matsanuga, H. Yamaki, and T. Nishimura, Biochem. Biophys. Res. Commun. **122**:460–465, 1984; K. Matsanuga, H. Yamaki, T. Nishimura, and N. Tanaka, Antimicrob. Agents Chemother. **30**:468–474, 1986). These workers used temperature-sensitive mutants of *Escherichia coli*, defective in different aspects of DNA replication [*dnaC*(Ts) or *dnaE*(Ts)], to show that aminoglycosides block the initiation but not the continuation of this process. The aminoglycosides appear to do so by some mechanism other than simple interference with the synthesis of required new initiation proteins, since chloramphenicol did not block the initiation; moreover, aminoglycosides were shown to interfere with reconstitution of a DNA-membrane complex in vitro. This interference suggests that the antibiotic interacts specifically with a component(s) of the assembling initiation complex, just as it does in interfering with initiation in protein synthesis.

Presumably either the blockade of protein synthesis or the blockade of DNA synthesis could account for the lethal action of aminoglycosides; presumably both effects occur in the cell, but the interference with protein synthesis might begin earlier in most cells, because the cycle of DNA replication is longer than the macrocycles of translation.